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Impact of spiritual beliefs and faith-based interventions on diabetes management

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Abstract

Management of diabetes constitutes significant social and economic burdens worldwide. There is a shortage of empirical studies on the management of diabetes and the associated mental health issues through spiritual beliefs and faith-based interventions (FBIs). It is not also clear how spiritual beliefs and FBIs account for the effective management of diabetic conditions. This article discusses the impact of spiritual beliefs and FBIs in the management of diabetes, from relationship and efficacy studies that report outcomes from experimental procedures of related interventions. The majority of the relationship studies showed positive relationships, while efficacy studies showed a high efficacy of interventions in faith-based approaches. However, none of the studies clearly reported the mechanisms of change or modality of operation in a FBI that can serve as a model across culture and context. Possible mechanisms of change were discussed for further development of a standard faith-based model, and finally, suggestions for future research were also highlighted by the authors.

Key Words: Comorbid health conditions; Diabetes; Faith-based interventions; Diabetes management; Spirituality; Coping strategies

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Core Tip: Studies tend to show that spiritual beliefs are linked to the acceptance and

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management of diabetes conditions. Other studies show that faith-based interventions (FBIs) can be useful in diabetes management. However, there is an absence of studies showing the pathway to the positive impact of spiritual beliefs and FBIs on diabetes management. We explored the relationships and effects of spiritual beliefs and FBIs on diabetes management through literature review. Mechanisms of change and directions for further research were also discussed.

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INTRODUCTION

Diabetes is among the chronic diseases that plague the victims throughout their lives. Diabetic conditions have been linked to comorbid health conditions such as blindness, kidney failure, and non-traumatic lower limb amputations[1,2]. The worldwide prevalence of the lifelong disease has continuously increased from 422 million in 2014 to 463 million people in 2019, and causes about 10% of United States annual expenditures on the adult population[1,2]. About 1.6 million children and adolescents are also living with chronic illness[1]. Diabetes is among the top 10 causes of global mortality[3,4]. Diabetes accounts for increased mortality from comorbid diseases such as cardiovascular disease, stroke, chronic kidney disease, chronic liver disease, and cancer[3]. The rising global prevalence of deaths and disability-adjusted life-years due to diabetes is estimated to be about 22.9 million. Hence, about 1 in 10 persons worldwide is suffering from one type of the three diabetes including type 1 diabetes, type 2 diabetes mellitus, and gestational diabetes mellitus[5].

Patients living with diabetes experience socio-economic challenges such as loss of a job, dependence on medical and nursing care, reduced social and family interactions and changes in lifestyle[4,6]. This is because, unlike other disease conditions, where only medication is required to manage/cure, diabetes presents more complicated physiological, psychological and social conditions that make the management very difficult[7-9]. Though, diabetes may be managed through medication and lifestyle modifications such as weight loss, diet, and exercise[10,11], there is also a high need for spiritual and psychological management[8,9].

This is because amputation and other disabilities and discomfort due to diabetes account for an array of disruptions in the patients' physical, mental, and spiritual lives[12]. The spiritual health of diabetic patients can synchronize the physical, mental and social dimensions of their lives, and is necessary for coping with and management of the disease[7]. Physical disabilities imposed by diabetes such as organ amputation tends to make the patients, mentally and spiritually disabled, exposing them to elevated stress[13]. Thus, such patients seek different approaches to cope with and adapt to life.

There have been noteworthy arguments as to whether spirituality/religiosity directly affects diabetes outcomes and well-being globally. Spirituality can be a powerful coping strategy for persons with debilitating health conditions such as diabetes[14]. Several studies indicate that increased religiosity is associated with better outcomes in clinical and general populations. Religion/spirituality generates a positive attitude towards life and life experiences, making the patient dominant against ill-fated life events including disease conditions (such as diabetes) and improving life with motivation and energy[6]. This increases the tolerance and acceptance of unchangeable situations, especially when science is unable to help a patient[15]. When disease condition becomes chronic and defies medical interventions (as is typical of diabetes), patients and physicians tend to resort to praying and spiritual approaches. Furthermore, medical researchers have acknowledged the importance of medical procedures, as well as of traditional and complementary therapies such as prayer to treating the diseases[15]. Studies also suggest that in caring for patients, medical personnel should not underscore the patients' religious beliefs[16]. This is because, people's belief about the cause, prognosis and mortality of their disease conditions affect their responses to treatment and intervention[17].

Since diabetes is a chronic and terminal condition, which needs the mental and physical involvement of the patients for management, it is necessary to consider management approaches linked to spirituality and faith. Studies have shown that spirituality and faith-based interventions (FBIs) are viable management strategies for diabetes[18-20]. Religion and spirituality are frequently engaged as coping mechanisms for diabetes and other psychologically threatening conditions and have been shown to effectively improve acceptance of diabetes and self-care behavior[18]. Another study on coping and glycemic control in couples with type 2 diabetes showed that religion and faith could help in glycemic control[21].

The importance of spiritual beliefs in therapeutic practice has been demonstrated by various professional organizations in social work, psychology, and counseling, such as the Council for Social Work Education, which added it to their central aspect of human behavior interventions[22]. However, very few articles have deeply addressed the issue of spirituality and FBIs in diabetes management.

This paper adds to the quality of information available in this area. This paper examines the impact of spiritual beliefs and FBIs in diabetes management.

SPIRITUAL BELIEFS AND DIABETES MANAGEMENT

Spiritual beliefs are invaluable in the management of diabetes and other chronic health conditions. Spirituality refers to the meaning or purpose in one's life, a search for wholeness, and a relationship with a spiritual being or reality. Spirituality involves the search for meaning and purpose through which one establishes his/her relationship with time, oneself, others, and God[23]. Individual's spiritual beliefs may be expressed through religion or religious involvement, involving participation in an organized system of beliefs, rituals, and cumulative traditions[24]. Spiritual beliefs and activities can impact the management of chronic conditions through two different pathways. First, it can assist in coping with chronic illnesses by providing support, confidence, and hope, and second, it can interfere with coping resources, especially when patients neglect self-care activities and rely on prayer and/or meditation to manage their illness[25]. Empirical evidence demonstrates the relationship between spirituality and self-management of chronic diseases like hypertension[26] and diabetes[24].

Research has shown significant relationships between spiritual and religious beliefs and practices and general diet in patients with diabetes[20]. This suggests that personal adaptations of diet and other health practices such as self-care practices are linked to spiritual beliefs. Given the importance of self-care practices such as healthy food adaptation, adequate physical activity, proper medication practices, and regular glucose monitoring[27,28], the significant link between spiritual beliefs and such self-care practices suggests that spiritual beliefs impact the choice of management strategies and can make a difference in efficacy of management.

Additionally, spirituality is an imperative resource for emotional support[29,30]. In this regard, God is perceived as central in providing strength to deal with daily challenges; God is often called upon for help in controlling diabetes; and a strong belief in God, prayer, meditation, and support from church members were all sources of support. Literature shows that humans develop an increased tendency towards spirituality and religion, especially when they experience stress or chronic illnesses[31,32]. Spirituality assists in the management of patients' health by yielding positive mental effects[32]. Spirituality has also been identified as one of the important factors that affect the quality of life, quality of care, and satisfaction of patients with diabetes[33].

Hence, intervention using spiritual beliefs for the management of diabetes conditions involves utilizing any spiritual aspect in life, such as belief in a divine being, as a control to enhance self-management[34]. Some spiritual belief-related interventions are prayer, meditation, fasting, and mindful attention. Thus in a study in Black women with type 2 diabetes, religion and spirituality were related to glycemic control[35]. Furthermore, an exploratory study on the role of spirituality in diabetes management found minimal to profound impact; all participants appeared comfortable discussing spirituality within the context of strength and hope. A study conducted to explore the relationship of religiosity and/or spirituality to the self-care of diabetes[24] showed religion or spirituality as coping methods and social support. Studies have indicated that religious involvement is associated with better adaptation to chronic diabetes by improving attendance at scheduled medical appointments, and better compliance with medication[36]. Table 1 shows the results of previous studies on spiritual beliefs and diabetes management[37-41].

Table 1 Empirical results on the impact of spiritual beliefs on diabetes management

Ref.	Study objective	Method/sample	Result
Darvyri <i>et al</i> [9]	To evaluate the impact of spirituality/religiosity on. T2DM management and to summarize the evidence regarding T2DM outcomes, as they are related to religiosity or spirituality of people with diabetes	A qualitative study (cross-sectional)	The results showed a positive relationship between religiosity/spirituality and improved T2DM management. It also suggests that participation in church and spiritual beliefs had ameliorating effects on stress levels and thus, on glycemic control of these patients with diabetes
Irajpour <i>et al</i> [29]	To explore the spiritual aspects of care for chronic Muslim patients	A qualitative-descriptive exploratory study was conducted in Isfahan, Iran, on a purposive sample of 25 participants, including patients, caregivers, nurses, physicians, psychologists, social workers, and religious counselors	The spiritual aspects of care for chronic Muslim patients fell into four main themes. Among the four major themes was the religious aspect, including doing religious rituals, attention to religious values, and providing the possibility of performing religious practices. The second theme is the pastoral aspect, which consisted of giving consultation for finding the meaning of life/death, achieving intellectual transcendence, and improving the patient's communication with herself/himself and others
Amadi <i>et al</i> [37]	To assess the association between religiosity, religious coping in depression and diabetes mellitus, and selected socio-demographic variables (age, gender and occupational status)	Cross-sectional study (simple random sampling)	Participants in this study varied in their use of religion to cope with the stress of living with diabetes mellitus or depression according to their socio-demographic profile. Younger people with depression and diabetes used religious resources and religious coping methods to the same extent
Adejumo <i>et al</i> [38]	This study aimed to relate the psychosocial effects of religion and culture with the awareness, knowledge and attitude of Nigerians regarding diabetes prevention and care	Cross-sectional study (multi-centered random sampling)	Neglecting diabetes: 42% thought that if diabetes was neglected it could lead to kidney failure, and 23% thought it could lead to heart failure. Only 0.3% thought that neglecting diabetes could result in limb amputation 49% of patients would consult a doctor if they were ill, 43% would talk to family members, and 5% to their religious leaders. There were 7% who said they would comply with religious leaders in the management of diabetes. In terms of disease prevention, 7% of the participants would value their religious leaders
Heidarzadeh <i>et al</i> [39]	To explore the spiritual growth and its dimensions in the patients with type II diabetes mellitus	A qualitative study was conducted on adult patients with a history of at least one year of type II diabetes mellitus	The data analysis led to the emergence of 237 codes, three main themes, and seven subthemes. The primary themes included a tendency to spirituality, God-centeredness, and moral growth
Watkins <i>et al</i> [40]	To investigate the relationship among spiritual and religious beliefs and practices, social support, and diabetes self-care activities in African Americans with type 2 diabetes, hypothesizing that there would be a positive association	A cross-sectional design that focused on baseline data from a larger randomized control trial in 132 participants: most were women, middle-aged, obese, single, high school educated, and not employed	Significant relationships between spiritual and religious beliefs and practices and general diet. Additional significant relationships were found for social support with general diet, specific diet, and foot care
Martinez <i>et al</i> [41]	To examine client opinions about, and experiences with religious interventions in psychotherapy	A sample of 152 clients at a counselling center of a University sponsored by the Church of Jesus Christ of Latter-day Saints completed a survey with ratings of specific religious interventions with regards to appropriateness, helpfulness, and prevalence	Out-of-session religious interventions were considered more appropriate by clients than in-session religious interventions, but in-session interventions were rated as more helpful

T2DM: Type 2 diabetes mellitus.

FBI FOR DIABETES MANAGEMENT

Faith-based health promotion interventions and the relationship between dimensions of religion and numerous mental and physical health outcomes have been well researched[42]. An intervention is faith-based if it arises from a church's health ministry or a special interest group[43]. Four levels or features are used to identify FBIs. The first level requires the church to be used as the recruitment site for the intervention; the second level requires that the intervention be delivered at a church; the third level includes members of local churches in intervention delivery; and the fourth level includes spiritual elements in the health message of the program[44].

FBIs have consistently reported significant health outcomes such as reductions in weight, blood pressure, glycemic, and lipid levels and increases in disease-related knowledge, physical activity, and intake of fruit and vegetables. The literature identified some spirituality issues that form the pathways for the impact of FBI on

mental health on diabetic patients to include need for empowerment, courage, hope, finding meaning in suffering grieving or anxiety; patients' uncertainty about their self-efficacy in enduring the chronic illness; difficulty expressing feelings about the situation; expressing guilt, concerns, grief and/or difficulty, as well as reflecting on joys, hopes and values; concerns regarding how caregivers are coping with illness, accepting the illness and associated mortality; and feeling of abandonment by God and others[45-48]. FBIs often adopt approaches that are culturally-sensitive and behavior-oriented and aim to foster positive health outcomes through the integration of social support[49].

Within the framework of FBI, patients with such spirituality issues can be gained from referrals to spiritual care professionals, active listening, emotional support and emotional expression; sharing of self in discussion, art, music and/or prayer; acknowledging the importance of family in the patient's life; activity and exercise; humor; examination and encouragement of spiritual practices; observing sacred and divine spiritual rituals and practices such as prayer, communion, church attendance, guided visualization, relaxing, breathing[47]. FBI for diabetes prevention and management is held in faith-based organizations such as churches, synagogues, mosques, meeting houses, and other worship places. They may be organized as congregations, national networks, or as free-standing organizations.

In faith-based organizations, diabetes management programs can be carried out using different strategies such as sharing messages with members through lectures, newsletters, and announcements; providing access to information and resources on diabetes prevention and management; partnering with community coalitions that address diabetes; arranging educational activities within the organization; offering emotional and social support; organizing workshops and programs to support healthy living through nutrition and physical activity; conducting community outreach, screening, and education; providing healthy food and activities during planned events; implementing policies that support healthy behaviors within the organization.

FBI PROCEDURE

FBIs have been criticized for the absence of methodological rigor in many efficacy/effectiveness trials[50-52]. They generally utilize specific spiritual modalities such as prayers, meditation, voluntary fasting, sacred writing, focusing, journal writing and rituals[33,53-56]. Prayer as an intervention can be a vehicle for creating cognitive change[56]. The therapist can encourage clients to use prayer for coping, if appropriate, and praying in session might help to incorporate therapy into their worldview; practitioners can take advantage of clinical opportunities to use clients' prayer as a potential window into their spiritual and psychosocial functioning. Also, prayer might be used as a vehicle for creating cognitive-behavioral changes[57].

Meditation can be used as a method to attain a balanced lifestyle, and the topic of lifestyle balance can be introduced early in the clinical process. After discussion and questions about meditation are completed with the client in the session, the client should be given instructions for a practice session in the office[58]. Sacred writings, also known as religious bibliotherapy[59,60] can be used when it is determined to be of value to the client, and the particular writings can be examined at least cursively in advance by the therapist. Miller *et al*[61] notes that such materials are useful for self-help, education, psychosocial support, and interaction. Focusing technique is defined as "the vague, bodily, holistic sense of the situation such as a problem, creative project, or spiritual experience" Miller *et al*[61]. Through this intervention, the clients may learn to listen to themselves without judgment. Journal writing may be in the form of chronology, recollections and focused analysis. The intent is to help the client feel free and safe. Clients often learn to trust themselves and learn their inner thoughts and feelings and find inspiration. To effectively implement FBIs, Dodd[62]observed that it is very important to have the keenness and capability to incorporate spirituality into the psychotherapeutic process when appropriate. Lancaster *et al*[63] observed that the use of faith-based organizations can provide opportunity for the delivery of positive health messages and fostering of acceptance of healthy behavior due to the relevance of faith to many client populations. Another means of modality in FBIs is rituals. Rituals are religious or secular formalized behavior patterns that draw out certain feelings. They include creating a sacred space, the expectation of a change in insight, attitude, affect, or the receipt of guidance, and the expectation of awareness of the transcendent[64].

In a systematic review, Lancaster *et al*[63] notes that FBIs targeting changes at both the church and individual levels would have a greater impact on weight loss and related behaviors than interventions targeting a single level; interventions involving lay health advisors (LHAs) would be more successful in facilitating behavior change than investigator-led interventions. When LHAs facilitate the implementation of health programs faith-based organizations their relationships and familiarity with key church personnel, procedures and members can help facilitate outcomes[63]. The research further showed that FBIs that include religious or spiritual components (*e.g.*, scripture, biblical concepts) would lead to greater improvements in outcomes than faith-placed interventions based on surface-level characteristics (*e.g.*, race, commonly eaten foods), including conducting programs in culturally appropriate settings[63]. Hence the model of the process of FBIs is based on cultural background, spiritual perspective, and relationships, all of which are embedded in social-cognitive modalities.

IMPACT OF FBI ON DIABETES

Faith-based therapeutic interventions have been widely applied in managing diabetes and related variables across the world. An FBI on a multi-component curriculum including Scripture readings, prayer, goal-setting, a community resource guide, and walking competitions showed a decreased systolic blood pressure by 12.5 mmHg among intervention participants and only 1.5 mmHg among controls ($P = 0.007$)[47]. In a preliminary study[64], presented the results of "faith on the move", a randomized pilot study of a faith-based weight loss program for black women. The study's goals were to estimate the effects of a 12-wk culturally tailored, faith-based weight loss intervention on weight loss, dietary fat consumption, and physical activity in overweight/obese black women. Although the results were not statistically significant, the effect size suggests that the addition of the faith component improved results.

Sattin *et al*[65] used a "fit body and soul (FBAS)" (an FBI program) for diabetes prevention to reduce weight and fasting plasma glucose (FPG) and increase physical activity from baseline to week-12 and to month-12 among overweight parishioners and recorded a significant decline in FPG in FBAS compared to the comparison group. In a methodological review, another study[47] found that faith-based organizations may be a promising avenue for delivering diabetes self-management education to Black Americans.

Another study on faith-based diabetes prevention program (fine, fit, and fabulous) for Black and Latino congregants at churches in low-income New York City neighborhoods, which included nutrition education and fitness activities while incorporating bible-based teachings that encourage healthy lifestyles, accounted for statistically significant change in participants' dietary habits[66]. Participants reported that they ate less fast food and were less likely to overeat at follow-up. The average weight loss across churches was 4.38 pounds or 2% of participants' initial body weight. Churches and other faith-based organizations are increasingly popular settings to conduct health promotion programs[48]. Table 2 shows the works conducted so far on the impact of FBIs on diabetes management. Table 2 suggests that all the studies found a positive impact of FBI in the management of diabetes across populations[67-70].

MECHANISMS OF CHANGE FOR FBIS FOR DIABETES MANAGEMENT

Considering that FBIs are efficacious in the management of diabetes, it is right to propose that such interventions work with multi-modal mechanisms, affecting different dimensions of the illness. FBI has positive effects on the prevention, self-management and mental health of patients with diabetes[49]. This suggests that FBI may take multiple pathways to affecting different dimensions of diabetes, however, little is known about the mechanisms of change in the area of FBIs for diabetes management. Mechanisms of change explain the key processes within a therapeutic intervention that are crucial to clinical change. Investigating mechanisms of change can help to identify and preserve the ingredients of an intervention which must not be diluted to achieve change and can enable the development of more effective treatments[71].

In the case of FBI for diabetes management, some of the paramount mechanisms are increasing general and religious social support, strengthening spiritual beliefs and cognition, providing relevant information, and integrating health-religion relationship

Table 2 Studies on the impact of faith-based interventions on diabetes management

Ref.	Topic	Study objective	Sample	Intervention	Result
Duru <i>et al</i> [47]	Sisters in Motion: A randomized controlled trial of a faith-based physical activity intervention	To evaluate a faith-based intervention ("Sisters in Motion") intended to increase walking among older, sedentary African American women	Sixty-two African American women > 60 yr	Multi-component curriculum including scripture readings, prayer, goal-setting, a community resource guide, and walking competitions. Both intervention and control participants participated in physical activity sessions	At 6 mo, intervention participants had increased their weekly steps by 9883 on average, compared to an increase of 2426 for controls ($P = 0.016$); SBP decreased on average by 12.5 mmHg among intervention participants and only 1.5 mmHg among controls ($P = 0.007$)
Fitzgibbon <i>et al</i> [64]	Results of a faith-based weight loss intervention for black women	The goals of the study were to estimate the effects of a 12-wk culturally tailored, faith-based weight loss intervention on weight loss, dietary fat consumption and physical activity	Fifty-nine overweight/obese black women were randomized to one of the two interventions	"Faith on the Move," intervention	Although the results were not statistically significant, the effect size suggests that the addition of the faith component improved results.
Sattin <i>et al</i> [65]	Community trial of a faith-based lifestyle intervention to prevent diabetes among African-Americans	To reduce weight and fasting plasma glucose and increase physical activity from baseline to week-12 and to month-12 among overweight parishioners through a faith-based adaptation of the diabetes prevention program called "FBAS"	604 African Americans, aged 20 to 64 years single-blinded, cluster-randomized, community trial	FBAS is an adapted faith-based diabetes prevention program	FBAS participants had a significant difference in adjusted weight loss compared with those in HE (2.62 kg <i>vs</i> 0.50 kg, $P = 0.001$) at 12-wk and (2.39 kg <i>vs</i> -0.465 kg, $P = 0.005$) at 12-mo and were more likely (13%) than HE participants (3%) to achieve a 7% weight loss ($P < 0.001$) at 12-wk and a 7% weight loss (19% <i>vs</i> 8%, $P < 0.001$) at 12-mo.
Gutierrez <i>et al</i> [66]	Health, community, and spirituality: Evaluation of a multicultural faith-based diabetes prevention program	To evaluate FFF, a faith-based diabetes prevention program for black and Latino congregants at churches in low-income New York City neighborhoods	Participants ($n = 183$)	FFF, a faith-based diabetes prevention program. FFF is a 12-wk, bilingual program developed by the Bronx Health REACH Coalition, FFF includes nutrition education and fitness activities while incorporating Bible-based teachings that encourage healthy lifestyles	Participants reported statistically significant improvements in knowledge and healthy behaviors from baseline. Increased numbers of participants reported exercising in the past 30 d, eating fruit daily, being able to judge portion sizes, and reading food labels
Frank <i>et al</i> [67]	A faith-based screening/education program for diabetes, CVD, and stroke in rural African Americans	To investigate the effectiveness of a faith-based screening/education program for reducing diabetes, cardiovascular diseases, and stroke in rural African Americans	120 parishioners from African American churches	The program included education about the prevention of diabetes and cardiovascular diseases	Positive feedback was recorded by both pastors and participants
Rhodes <i>et al</i> [68]	Cost-effectiveness of a faith-based lifestyle intervention for diabetes prevention among African Americans: A within-trial analysis	To assess costs and cost-effectiveness of implementing FBAS, a church-based 18-session lifestyle education intervention for African Americans	604 overweight participants in 20 churches	FBAS, a church-based 18-session lifestyle education intervention	Per-person intervention cost of FBAS was \$50.39 more than HE (\$442.22 <i>vs</i> \$391.83 per person), and adjusted differences in weight change (1.9 kg [95%CI: 1.0-2.8]) and waist circumference (2.4 cm [95%CI: 1.3-3.4]) were both significant. For a modest increase in cost, FBAS led to greater weight and waist reductions among African Americans in a church setting
McElfish <i>et al</i> [69]	Design of comparative effectiveness of a randomized controlled trial testing a WORD DPP <i>vs</i> a PILI DPP for Marshallese in the United States	To investigate the comparative effectiveness trial testing 2 DPP interventions designed to reduce participant's weight, lower HbA1c, encourage healthy eating and increase physical activity	384 Marshallese participants from 32 churches located in Arkansas, Kansas, Missouri, and Oklahoma	WORD DPP focuses on connecting faith and health to attain a healthy weight, eat healthily, and be more physically active. In contrast, PILI DPP is a family and community-focused DPP curriculum specifically adapted for	Ongoing

				implementation in Pacific Islander communities	
Goode[70]	The effect of a diabetes self-management program for African Americans in a faith-based setting (pilot study)	To test a 6-wk faith-based diabetes self-management program for African American adults diagnosed with diabetes	32 African Americans 18 yr or older participate in the study	Diabetes self-management education intervention	There were significant improvements among participants in diabetes knowledge, self-efficacy, diabetes symptom management, and improvements in diabetes self-care activities (diet, exercise, and foot care)

CVD: Cardiovascular disease; DPP: Diabetes prevention program; FBAS: Fit body and soul; FFF: Fine, fit, and fabulous; PILI DPP: Pacific culturally adapted diabetes prevention program; WORD DPP: Faith-based diabetes prevention program.

through improving emotion regulation and cognitive restructuring[71,72]. For clarity, **Figure 1** provides the pathways to changes in diabetes management due to FBI. Hence, we proposed that providing FBI for diabetes management culturally tailored and affect different dimensions that are sensitive to diabetes prevention, management and control. Within the Social Cognitive Theory Framework, FBI would improve diabetes knowledge, self-efficacy, diabetes symptoms management, and diabetes self-management outcomes. To this end, FBI focuses on the three major dimensions, including the person (diabetes knowledge, self-efficacy, symptom management) and behavior (diabetes self-management) and the environment (the church setting). In the light of these expositions, we present a framework of FBI in the context of diabetes management as shown in **Figure 1**.

IMPLICATIONS AND SUGGESTIONS FOR FURTHER RESEARCH

The present study has helped to illustrate the impact of FBIs and spiritual beliefs in the management of diabetes. The outcome of the study calls for emergent FBI modalities for diabetes management across the world. Further studies may attempt to develop and validate a standardized FBI program that would be useable in different religious samples. Such will provide handy, step-by-step approaches to FBI for diabetes. Researchers should attempt to increase access to diabetes management using a faith-based framework in different religious organizations. This is especially important given the place of effective management in diabetes prevention, treatment and control.

The spiritual beliefs of patients living with diabetes are of paramount impact for the purpose of maintaining good mental health of the patient[7,11-14]. Linking spirituality with health has been found to be relevant in understanding the impact of FBI in the management of diabetes[15]. Further studies are encouraged to trace the spiritual bases of diabetes management by finding out the mechanism through which spirituality affects diabetes outcomes. Given the link between spiritual variables such as prayers and beliefs and scriptures with diabetes management, and since the present study only relied on existing studies irrespective of their methodological flaws, correlation studies are encouraged, examining the impact of spiritual beliefs on diabetes outcomes. Studies should be intensified to determine the mechanisms of change in the FBI for diabetes management through experimental approaches. This will help determine the specific faith-based factors that account for positive change in diabetes management with FBIs.

CONCLUSION

There is a tendency of spiritual beliefs to be linked with the acceptance and management of diabetes conditions and FBIs can be useful in diabetes management.

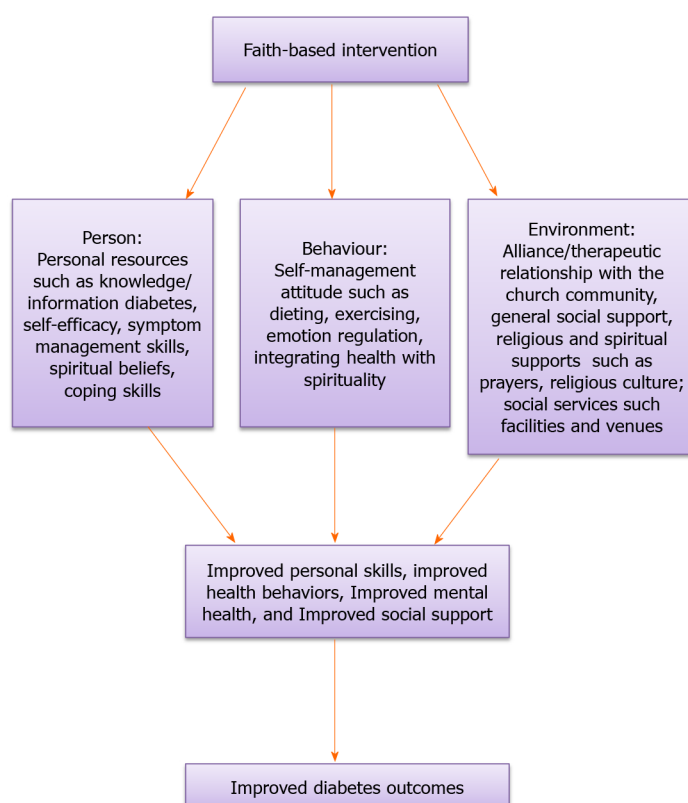


Figure 1 Framework of faith-based intervention in diabetes management. The faith-based intervention acts on the three reciprocal sources of learning according to social-cognitive theory (the person, behavior and the environment). The three sources interact to produce improved skills, health behavior, mental health and social support. Finally, the improved outcomes lead to positive outcomes in diabetes management.

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